

Introduction to Philosophy

Philosophy 110W
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Class #21 - Functionalism

Identity Theory

the mind is the brain

- Paradigmatic theoretical identifications
 - Lightning is electrical discharge.
 - Water is H₂O.
 - Mental states are brain states.
- People were once ignorant of the nature of lightning and water.
 - Now we know.
- People currently do not know that their pains are really stimulations of C-fibers in their brains.
- We can use the old terms (lightning, water, pain) as shorthand (for electrical discharge, H₂O, and C-fiber stimulation).

Identity Theory as Type Physicalism

- Consider a list of descriptions of brain states, S_n .
 - ▶ which neurons are firing
 - ▶ which have recently fired
 - ▶ which inputs are lit up
- The identity theory is a series of clauses correlating mental states with brain states.
 - ▶ x has a toothache iff x is in brain state S_{412}
 - ▶ x is seeing blue iff x is in brain state S_{7583}
 - ▶ x believes that snow is white iff x is in brain state S_{9238}
 - ▶ etc.
- We should be able to find the specific brain states that correspond to all mental states.
 - ▶ Qualitative states: toothaches and earaches and perceptions of colors and odors
 - ▶ Intentional states: beliefs and desires

Three Problems of Multiple Realizability



Chauvinism



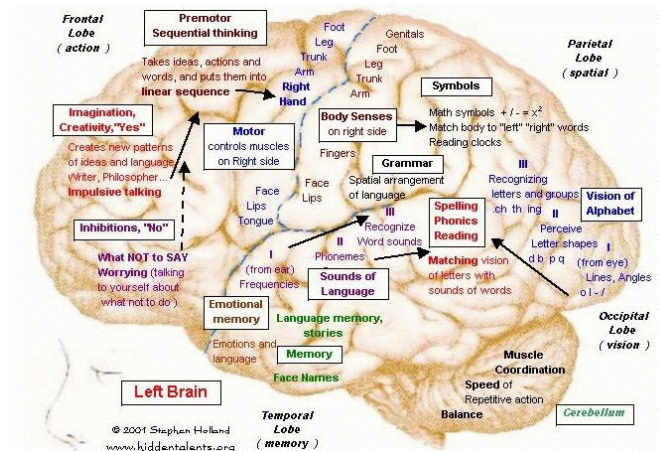
- We might want to attribute sensations like ours to aliens or machines or animals who do not share our brain structures.
- If mental states are realizable in different kinds of brain states, the identity theory is chauvinistic.
- A chauvinistic theory is too narrow.
- Identity theory attributes mental states only to creatures with human brains.
- Some psychological states, like fear, seem shared by animals.
- Aliens made of silicon, instead of carbon, could have pains, color sensations, and beliefs and desires.
- If pain is a specific state of a brain, as the identity theorist claims, the aliens can't have pain.
- Are mental states realizable in multiple kinds of material?

Neuroplasticity

- Even human brains do not all work the same way.
 - Occurrent sensations
 - Belief states
- My brain state, when I see blue, may be different from your brain state, when you see blue.
 - Diverse experience and development
- The brain is not completely plastic, but parts can be repurposed.
- There may be no single S_n to correspond to the same belief in different people, in the way that heat always corresponds to kinetic energy.

Neurological Equipotentiality

- Human brains realize their states in different ways.
 - Karl Lashley
- Language is normally processed in the left hemisphere for righties.
- People with damage in the left hemisphere may process language in their right hemisphere.



Disjunctive Theories

- Given equipotentiality, identity theory will have the following sorts of clauses:
 - ▶ x_1 has a toothache iff x_1 is in brain state S_{412}
 - ▶ x_2 has a toothache iff x_2 is in brain state S_{6224}
 - ▶ x_3 has a toothache iff x_3 is in brain state S_{91}
 - ▶ ...
 - ▶ So, x has a toothache iff $x=x_1$ and is in S_{412} or $x=x_2$ and is in S_{6224} or $x=x_3$ and is in S_{91} or ...
- Similar long clauses will hold for all mental states.
- Such a theory is disjunctive.
 - ▶ One mental state is identified with any of a variety of physical states.

The Relational Construal of Mental States

- A relational construal sorts mental states according to the relations among stimuli and responses.
- The identity theorist sorts mental states according to their physical properties.
- Consider the discovery that two disparate mental states, a leg cramp and the belief that chocolate pudding is tasty, have the same physical instantiations.
 - x has a leg cramp iff x is in brain state S_{3313}
 - x believes that chocolate pudding is tasty iff x is in brain state S_{3313}
- The pudding belief and the cramp sensation are instantiated by the same brain state.
- But they are different mental states.
- The identity theorist must say that they are the same state.
 - Mental states are just brain states.
 - x has a leg cramp iff x believes that chocolate pudding is tasty.
- By typing mental states according to their physical realizations, rather than by their first-person content, we leave open the possibility of making some wacky, unacceptable identifications.



Token Physicalism and Multiple Realizability

- Token physicalism can survive problems of multiple realizability.
- Even if we all have different brain states corresponding to relevantly similar mental states, they are all still physical states.
- Token physicalism says that disjunctive theories are perfectly acceptable.
- But, multiple realizability is a problem for type physicalism.

Behaviorism and Disjunctive Theories

- The behaviorist, like the type physicalist, appears committed to a disjunctive theory.
- There are no unique behaviors that correspond to particular mental states.
- Some people react to a painful stimulus by screaming, others by wincing, others by stomping about.
 - a thing is in pain iff it exhibits behaviors B_1 , or B_2 , or B_3 , or...

Are Disjunctive Theories Acceptable?

- If multiple realizability was not a problem for the behaviorist, maybe the identity theorist can also try a disjunctive theory, and hold on to token physicalism.
- The identity theorist would then correlate pain with any of a variety of brain states
 - ▶ pain-in-a-robot
 - ▶ pain-in-a-Martian
 - ▶ pain-in-a-chimp
 - ▶ pain-in-a-sea slug

More Disjunction

- A given behavioral state or brain state may realize different psychological properties at different times.
 - Squinting might be evidence of pain, or concentration, or blurry vision, or...
- Due to the non-relational construal of mental states, the same brain state may be correlated with different mental states.
- Thus, on either disjunctive approach (the behaviorist's or the identity theorist's), we have lots of disjuncts on both sides of the equations.
- We do not seem to be getting anywhere.
- We want to know what relates all these different states, what makes us call them all pain, or seeing-blue, or believing that snow is white.

Summary

- We have looked at three characterizations of the mind:
 1. Dualism: the mind is an immaterial substance.
 2. Behaviorism: the mind is behavior.
 3. Identity theory: the mind is the brain.
- Identity theory has parsimony on its side, against dualism, and it is an empirical, scientific theory.
- There are good reasons to prefer science to metaphysical speculation, where possible.
- But the problems with identity theory, including its anemic analysis of consciousness and the modal and multiple realizability objections, will lead us to one last theory of the mind: functionalism.

Functionalism

Billy

Motivations for Functionalism

- Avoid the identity theorist's chauvinism and non-relational construal of mental states
- Avoid the behaviorist's denigration of internal states
 - "Since mental states interact in generating behavior, it will be necessary to find a construal of psychological explanations that posits mental processes: causal sequences of mental events" (Fodor 454a).
- Type mental states according to behavior
- Abstract away from the particular hardware
- The mind is the software of the brain.
 - "In the functionalist view the psychology of a system depends not on the stuff it is made of (living cells, metal or spiritual energy) but on how the stuff is put together" (Fodor 451).

Generalizing Over the Hardware

- Functionalist definition of pain
 - A thing is in pain if it has been affected in certain relevant ways, and if it has other concomitant mental and behavioral states (like wincing or crying) which are causally related to it.
- When we are researching the mental states of a particular organism, we will of course look at the specific causal processes involved.
- But, when we generalize to a functionalist theory of mind, we abstract away from physical particulars.
- Ramsification: a logical trick to eliminate irrelevant vocabulary from the theoretical identity sentences of a formal theory of mental states.
- Replace references to the specifically mental parts of this theory, pains and color terms and beliefs, with variables.

David Lewis on Ramsification

- We are assembled in the drawing room of the country house; the detective reconstructs the crime. That is, he proposes a *theory* designed to be the best explanation of phenomena we have observed: the death of Mr. Body, the blood on the wallpaper, the silence of the dog in the night, the clock seventeen minutes fast, and so on. He launches into his story:
- X, Y and Z conspired to murder Mr. Body. Seventeen years ago, in the gold fields of Uganda, X was Body's partner... Last week, Y and Z conferred in a bar in Reading... Tuesday night at 11:17, Y went to the attic and set a time bomb... Seventeen minutes later, X met Z in the billiard room and gave him the lead pipe... Just when the bomb went off in the attic, X fired three shots into the study through the French windows...
- And so it goes: a long story. Let us pretend that it is a single long conjunctive sentence. The story contains the three names 'X', 'Y' and 'Z'. The detective uses these new terms without explanation, as though we knew what they meant. But we do not. We never used them before, at least not in the senses they bear in the present context. All we know about their meanings is what we gradually gather from the story itself. Call these theoretical terms (T-terms for short) because they are introduced by a theory.

Psychology

- A psychological theory correlates mental states with inputs and outputs.

$T(s_1 \dots s_n, i_1 \dots i_m, o_1 \dots o_k)$

- i_{7345} = having an orange soda can in front of you
 - s_{2342} = seeing the cylindrical orange patch
 - s_{4873} = desiring orange soda
 - s_{92357} = enjoying an orange soda
 - o_{983} = Saying, 'Ahh, I enjoyed that orange soda'
- E.g. Whenever a person is in state s_{4873} and receives input i_{7345} so that she develops state s_{2342} , she also moves into state s_{92357} and produces output o_{983} .
 - For the identity theorist, the s_n are human brain states.

Behaviorist Psychology

- $B(i_1 \dots i_n, o_1 \dots o_m)$
- Look, Ma, no mental state terms!
- Parsimony

Identity Theory and Multiple Realizability

- $T(s_1 \dots s_n, i_1 \dots i_m, o_1 \dots o_k)$
- To avoid problems of multiple realizability, we want to generalize over the s_n .
- The functionalist satisfies the multiple realizability condition by claiming that the $s_1 \dots s_n$ can refer to any kinds of states.
 - even states of an immaterial soul

Ramsification

- To generalize, we replace this theory...
 - ▶ $T(s_1 \dots s_n, i_1 \dots i_m, o_1 \dots o_k)$
- ...with this one:
 - ▶ $\exists x_1 \dots \exists x_n T(x_1 \dots x_n, i_1 \dots i_m, o_1 \dots o_k)$
- p is enjoying an orange soda iff $\exists x_1 \dots \exists x_n T(x_1 \dots x_n, i_1 \dots i_m, o_1 \dots o_k)$ and p is in x_{92357}
 - ▶ a functional, causal-role definition of your mental states
- x is in pain iff x has been affected by the kinds of things that cause pain, has other mental states that generally accompany pain, and exhibits the kind of behavior that are associated with pain.
- Pain is whatever has the place that pain has in your life.
 - ▶ preceded by physical or emotional blows
 - ▶ succeeded by characteristic behavior
 - avoidance
 - valiant confrontation
 - ▶ engenders certain other mental states
 - fear or anger or resignation

Functionalism and AI

- Liberal view of mind
- We might wonder if the difference between machines and human beings has some biological basis.
- Searle argues that there is something essentially biological about mentality.
 - Responding both to claims of machine intelligence and to claims that we can test functionalism by constructing models of human minds.
- To understand minds, according to the functionalist, we can examine computer models and their software.
- Computers and their software work according to purely formal, syntactic manipulation.
- They merely follow algorithms, every step of which can be specified syntactically.

The Chinese Room



Searle's Argument

1. Programs are completely describable in terms of their formal, syntactic content.
2. Minds grasp the meanings, or semantics, as well as syntax.
3. Syntax alone can not produce semantics.

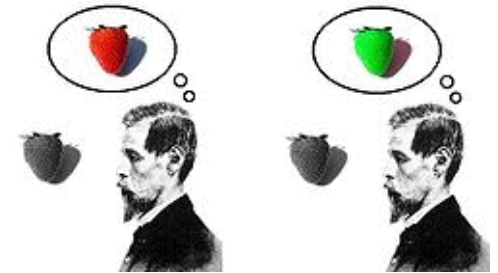
So, minds are not merely syntactic manipulators; i.e. minds are not mere programs.

There is more to our minds than algorithmic processing of sensory input toward the production of motor output.

Qualia Issues

- Materialist theories of mind fail to capture our internal mental lives.
- The behaviorist rejected all first-person evidence as misleading and useless.
- The Identity theorist accepted that internal states were causes of behavior, rather than identical to behavior, but identified the mental states with their neural correlates.
- Both theories work better as third-person accounts of mental states than as first-person accounts.
- Similarly, functionalism has been criticized for failing to account for the way that mental states appear to us, for consciousness.
- absent qualia argument
- inverted qualia: two people could be identical in their behavior, and indeed in their functioning, and yet not share the same phenomenal experience.

Inverted Spectrum



- What if every time one person saw red, another person saw purple?
 - Every time one saw blue, the other saw green, etc.
- They could still use the same terms; they would be functionally isomorphic.
- But, they would be having different qualia.
- If there are cases of inverted qualia, then people with the same functional states are in different mental states.
- And, there seems to be no way to deny the possibility of inverted qualia.
- Similar problems could be constructed for all sense modalities.

Absent Qualia



- Homunculi headed robot
 - The brain of a creature functionally equivalent to me turns out to have tiny persons inside his brain, rather than neurons, performing exactly the same functions that the neurons perform in my head.
- Chinese Nation
 - The creature looks and functions just like us with an artificial processing system made out of the people in China.
- In both inverted and absent qualia cases, the functionalist seems to fail to account for occurrent sensory states.

Zombies: Another Problem for Functionalism



Summary

- The Chinese room argument shows that functionalism has a problem accounting for our intentional states.
- The absent qualia argument shows that functionalism has a problem accounting for our phenomenal states.
- Only the dualist provided a satisfying first-person account.
- But dualism has an apparently insuperable (and spooky) problem of interaction.
- Functionalism is the most widely supported contemporary theory of mind.